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8th Grade students' attitude towards technology

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Abstract

The aim of this study is to investigate eighth graders' attitude towards technology by gender, type of school (state and private), type of preferred high school, and technological devices owned. The study was carried out with 300 eighth graders in Büyükçekmece town of İstanbul during 2013-2014 education and instruction year. "Technology Attitude Scale" was administered to participants. Study data were analyzed by using SPSS 18. It was found out that there is a significant difference between types of school the students attend in relation with the "Negativeness of Technology" subscale only, whereas gender made a significant difference across the scale as well as three subscales except for "Contribution and Importance of Technology". Students' overall attitude towards technology, disadvantages of technology and their tendency to technology showed a significant difference according to the type of high school for which the students prepare. Such difference was in support of the participants preparing for science high schools. In addition, it was seen that those having technological devices had higher attitude scores than the others. Specifically, significant difference was found between those having and not having tablets in the second subscale, which is "Disadvantages of Technology".

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Keywords: Middle school students, Technology, Attitude, Technology Attitude

1. Introduction

Technology as one of the essential needs of today's people has been a prominent factor shaping our lives. Today technology is so influential that technology is defined as an area covering all of the social and economic activities and organizations envisaging putting into practice of technical knowledge (Erdemir, Bakırcı & Eyduran,

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2009). Human beings have applied to technology in relation with almost any activity of them and improved it in parallel with certain needs and experiences. Thanks to the technology, individuals and societies could be stronger in the face of phenomena and happenings, and their life became easier (Şemsettin & Odabaşı, 2004).

It goes without saying that technology plays an important role in our life. Its definition is given by contemporary dictionary of Turkish Language Society as a collection of tools and equipment developed by human beings to control and change their material environment and knowledge regarding them. In public opinion held by Pearson (2006) in the United States in 2004, 1000 adults were asked about the immediate association of technology in their mind. 68 % of the participants mentioned computer, 5 % electronics, and 2 % mentioned internet. It was seen that consciousness about technology has not been raised yet (Oktay & Çakır, 2012).

Almost embedded in human life, increased technology use is involved in many areas including communication, which also speeded use of technology in education (Altun, 2011). Technology has played an effective role for improvement in education (Akkoyunlu, 2002). It is known that all societies primarily including developed countries struggle to provide high quality education for their members by using the technology. Turkey is not an exception in that struggles towards improving education and instruction processes with computer and computer-based technology are increasingly ongoing (MEB, 2005). Interacting with each other, education and technology are quite important in today's education system. Despite the fact that all of the educational problems cannot be solved with technology alone, it is known that any instruction approach lacking technological support affects achievement negatively; thus, using technology and computers in today's education (Erdemir, Bakırcı & Eyduran, 2009; Çelik ve Kahyaoğlu, 2003) has been compulsory. Reasons for using computers in education are listed as reinforcing learning, helping learners form their own knowledge, motivating learners and increasing flexibility of curriculum (Hançer & Tüzemen, 2008).

Devices such as computer, internet, mobile phones and television occupy a considerable place in our lives, and thus the large amount of time we spend on them implies the importance of technology for our life (Bacanak, Karamustafaoğlu & Köse, 2003; Aydoğan, 2013). Today some students constantly use various technological devices such as computer, internet, tablets, video, CD's and mobile phones. It is likely that challenges will emerge unless educactional institutions and teachers can improve students' skills for using existing technological devices and raise counsciousness of using them properly (Aksoy, 2003; Reiner, 2009). Thus, a big task falls to teachers for adapting technology to education because the attitude towards technology raised by teachers, their efforts to use technology and skills of using it will inevitably affect students' using of technology and their attitude regarding it (Oktay & Çakır, 2012). Research shows that those investing more time and effort on using of technology and computers in education have positive self-confidence and efficacy (Rugayah, Hashim&Wan, 2004 cited by Erdemir, Bakırcı & Eyduran, 2009).

Individuals' information and skills regarding technology are too important to ignore planning. It is considered that teachers and students as main actors in development and change of societies can change a society's overall view regarding technology (Oktay & Çakır, 2012). It is of top priority to figure out both teachers and students' attitude towards computer so that expected computer use can reach the necessary level and it can be used effectively in the context of education (Altun, 2011). Kenar and Balcı (2012) think that the meaning of technology for students can be understood only if their attitudes can be delineated clearly. As for attitude, they define it as "the state of having a positive opinion regarding a subject or course, enjoying the course or displaying positive affective signs regarding it".

Within the framework of technology and attitude research, there are studies on the importance of using computers and technology in education (Erdemir, Bakırcı & Eyduran, 2009) and attitudes of individuals towards a certain issue (Nuhoğlu, 2008). Most of national and international research shows that attitude is among the most important factors concerned with computer use, and negative attitude towards computers could affect individual motivation and performance in the same way (Altun, 2011).

In their study, Köse and Gezer (2006) suggest that effective and efficient use of computer technology in education have an effect on attitudes of such users as teachers and students; therefore, further studies on attitudes could light the way for those designing and assessing instruction programs. Gür, Özoğlu and Başer (2010) point out that most studies in Turkey were carried out to investigate teachers' attitude towards technology and using of technology in education and stress that they have a positive attitude.

In some of the studies regarding both teachers and students to computer, attitude scales were developed students' attitude towards computer at varying grades. Those attitudes were discussed in connection with several variables (Berberoğlu & Çalıkoğlu, 1991; Tezci, 2010) while some others were carried out in order to investigate the

relationships between attitudes towards computer and different situations (Şerefhanoğlu, Nakiboğlu & Gür, 2008).

Deniz (2006) in her study "Candidate teachers' attitude towards technology" found out that prospective teachers have a positive attitude towards technology. According to the study, attitudes of candidate teachers of science and mathematics towards technology were better than teachers of social sciences. There was not found any difference between attitudes of candidate teachers by gender. Lastly, previous perceptions of success of candidate teachers about science and mathematics had an influence on their attitude towards technology.

Akdur, Çiçek, Günay and Yıldızbaşı (2011) state that technology should be integrated into education due to the fact that there is a large number of people uneducated about information technologies in Turkey, and both education and economic investment should be made for the young population to facilitate Turkey's being an information society and being elevated to the league of developed countries. Bearing this in mind, it is essential to identify views of eighth graders about the way of using technology to obtain an overview about how to use the technology at their current level and identify their vision of technology in the future as they are in the most crucial grade for shaping their future. Present study is expected to shed light for other researchers on the same matter. The study was carried out with the purpose of identifying perspectives of eighth grade students regarding technology and describing how they perceive technology. Eighth graders were selected for the study since they are close to technology especially due to computers and they are going through the key level before choosing their profession at a contest. Study participants only included eighth graders among middle school students.

1.1 Study Aim:

The aim of this study is to determined attitudes of eighth graders at middle school towards technology. The study attempts to find out answers to the following research questions:

1. Is there any significant difference between attitudes of students towards technology at state and private middle schools?
2. Is there any significant difference between attitudes of middle school students towards technology by gender?
3. Is there any significant difference between attitudes of middle school students towards technology by preferred type of high school?
4. Does attitude of middle school students towards technology vary according to the technological devices owned (tablets, computer, mobile phone)?
5. What are the attitudes of middle school students towards technology like?

2. Research Method

This chapter gives an account of research model, study group, data collection instrument, data collection procedures and data analysis.

2.1. Research Model

Survey research model was applied in this study since our main aim was to examine middle school eighth grade students' attitude towards information technologies. "Survey research models are the very research approaches that aim to depict a situation that is either in the past or still available. The matter, individual or object that becomes the subject of the research is tried to be identified as is and with their own conditions" (Karasar, 2005).

2.2. Population and Sample

Study population comprised of 2956 students attending the eighth grade at middle schools within borders of Büyükçekmece District of İstanbul province during 2013-2014 education and instruction years. Of the students, 491 were at private schools, and the rest 2465 were at state schools. Purposeful sampling method was used, and 300 students from 2 state and 2 private schools participated in this study. However, study data could be obtained from 289 students. Representation rate of the sample was 9,777 %. Participant data are summarized in Table 1 below.

Table 1. Demographic data of study group

		f	%
Gender	Female	147	50,9
	Male	142	49,1
	Total	289	100
Type of school	State	157	54,3
	Private	132	45,7
	Total	289	100

2.3. Data collection instrument

For collecting data, a Turkish version of the questionnaire of Pupils' Attitudes towards Technology (PATT-TR) was used. Reliability and factorial validity of the Turkish version of PATT were completed by Yurdugül and Aşkar (2008). PATT-USA was originally constructed with 58 items by Dugger and Blame in the United States of America. It has been implemented in more than 25 countries, and usually named after the name of each country. Thus, the questionnaire was named as PATT-TR in Yurdugül and Aşkar (2008). To investigate the reliability and factorial validity of PATT-TR, Yurdugül and Aşkar (2008) administered the scale to 3308 pupils (10-16 ages) across several provinces of Turkey. According to the results, the Turkish version did not predict the 58 items on 6 sub-constructs of attitude in the original version. In addition it was observed that the two sub-constructs "technology & gender" and "personal prerequisites" didn't predict the general attitude. As a result, PATT-TR was structured on 24 items and 4 sub-constructs. The four components were identified as "Tendency to Technology", "Importance of Technology", "Negativeness of Technology" ve "Technology for all". It was a 5-point Likert scale (1: Totally disagree, 2: Disagree, 3: Neutral, 4: Agree, 5: Completely Agree). The PATT-TR consists of items under each sub-construct as in Table 2.

Table 2. Items per sub-construct of PATT-TR

Sub-construct	Items	Score range Low	High
Tendency to Technology	• I will probably choose a profession related with technology. • I enjoy journals related with technology • If there were a technology club at school, I would definitely join it. • I would prefer to have a job related with technology. • I should be able to select technology as a school subject. • I want to build a career in technology. • I like repairing things at home. • A profession related with technology would make a brilliant future.	8	40
Negativeness of Technology	• Using technology mitigates welfare of a country. • It would be boring to work on technology. • Technology causes large scale unemployment. • Most of the jobs related with technology are boring. • I find machines boring. • We should use technology less because it causes pollution. • Hobbies related with technology would be boring.	7	35
Importance of Technology	• Technology is useful for our future. • Technology helps things function better. • Technology is so important in life. • Everybody needs technology. • Technology is harmful than useful. • Technology is the subject of the future.	6	30
Technology for All	• Technology should be offered as a subject for all students. • Everybody can read about technology. • Everybody can get a job on technology.	3	15

Study data and Cronbach Alpha coefficients calculated from the scale as well as comments related with reliability of the scale (Kayış, 2008: 405) are given in Table 3.

Table 3. Reliability coefficients of the scale

Sub-construct	Cronbach Alpha Coefficient	Comment
Tendency to Technology	,870	Highly reliable
Negativeness of Technology	,734	Quite reliable
Importance of Technology	,786	Quite reliable
Technology for All	,711	Quite reliable
Overall	,875	Highly reliable

2.4. Collecting Data

In this study, data were collected by the researcher administering the questionnaire in four schools after obtaining permission of the district directorate of national education.

2.5. Analyzing data

Study data were analyzed by using SPSS 18. 11 of the questionnaire forms collected from 300 eighth grade students were not used for analysis because of uniform rating throughout the whole scale or leaving of almost all items unanswered. Percentage and frequency analysis were applied to the personal data obtained from the questionnaire. In addition, independent t-test was used to find out if there is significant difference within the study group by gender, type of school (state or private) and technological devices owned. t-test is used for examining significance of the difference between means of two unrelated samples (Büyüköztürk, 2008). Besides, one-way variance analysis was used to investigate if there is significant difference between students' attitudes towards technology according to the profession and high school they want to choose. Such variance analysis is used to test if difference between means of two or more unrelated samples is significantly bigger than zero (Büyüköztürk, 2008). Significance level was determined against "p<.05".

3. Findings

As a result of statistical analysis of the study data, following findings were obtained with regard to each sub-problem.

3.1. Findings regarding sub-problem of "Is there any significant difference between attitudes of students towards technology at state and private middle schools?"

Table 4 displays t-test results of students' attitude towards technology by school type.

Table 4. t-test results of students' attitude towards technology by school type

	School type	N	$\overline{X}$	S	sd	t	p
Tendency to Technology	State	157	23,76	6,86	287	,637	,524
	Private	132	24,31	7,70			
Negativeness of Technology	State	157	24,36	4,98	287	3,025	,003*
	Private	132	26,15	5,03			
Importance of Technology	State	157	21,96	4,49	287	,771	,441
	Private	132	22,36	4,31			
Technology for All	State	157	21,96	2,82	287	,430	,668
	Private	132	22,36	3,02			
Overall	State	157	79,35	13,42	287	1,708	,089
	Private	132	82,24	15,28			

*p<0,05

According to Table 4, type of school plays a significant role on middle school students' attitude towards technology only in relation with "Negativeness of Technology" sub-construct at significance level of "p<0,05" (t= 3,025, p=0,03). Means of the groups on this dimension show that students in private schools ($\overline{X}$ = 26,15) have a

higher score than those in state schools ($\overline{X}$ =24,36) about negativeness of technology. On the other hand, no significant difference was reported between state and private schools regarding tendency to technology (t= 0,637, p=0,523), importance of technology (t= 0,771, p=0,441) and technology for all (t= 0,430, p=0,668). Overall results show that there is no significant difference between students' attitude towards technology by type of school they attend (t=1,708 and p=0,89).

3.2. Findings regarding sub-problem of "Is there any significant difference between attitudes of middle school students towards technology by gender?"

t-test results of students' attitude towards technology by gender are given in Table 5.

Table 5. t-test results of students' attitude towards technology by gender

	Cinsiyet	N	$\overline{X}$	S	sd	t	p
Tendency to Technology	Female	147	21,63	6,57	287	-5,998	,000*
	Male	142	26,47	7,11			
Negativeness of Technology	Female	147	24,13	4,66	287	-3,653	,000*
	Male	142	26,27	5,28			
Importance of Technology	Female	147	21,68	3,58	287	-1,804	,072
	Male	142	22,61	5,09			
Technology for All	Female	147	8,95	2,86	287	-2,211	,028*
	Male	142	9,71	2,92			
Overall	Female	147	76,42	12,56	287	-5,368	,000*
	Male	142	85,07	14,78			

*p<0,05

As seen in the table, there is a significant difference in both overall scale (t (287)= -5,368, p=0,000) and three sub-constructs according to gender. Overall scale shows that males ($\overline{X}$ =85,07) have higher average scores than females ($\overline{X}$ =76,42). Tendency to Technology yielded values of "t= -5,998" and p=0,00", which indicates a significant difference between male and female students. In this sub-construct, average attitude score of females was found as "21,63", but males had "26, 47". So, it could be said males have a higher tendency to technology than females. Also in Negativeness of Technology, values of "t= -3,653 and p=0,000" indicate presence of a significant difference by gender. According to the scores, males ($\overline{X}$ =26,27) have a higher negative attitude towards technology than females ($\overline{X}$ =24,13). In relation with the sub-construct of Technology for All, the difference between males and females was found significant at significance level of "p<0,05" (t=2,211 and p=0,028). Mean/average values in the table show that males' attitude towards technology for all ($\overline{X}$ =9,71) is higher than females ($\overline{X}$ =8,95). Lastly, there was not found significant difference by gender in the sub-construct of Importance of Technology (t=1,804 and p=0,72).

3.3. Findings regarding sub-problem of "Is there any significant difference between attitudes of middle school students towards technology by preferred type of high school?"

Table 6. One-way Variance Analysis Results by Preferred Type of High School

	Source of variance	Sum of squares	sd	Average of square	F	p	Significant Difference
Tendency to Technology	Between Groups	511,984	4	127,996	2,484	,044*	Anatolian H.S.-Science H.S.
	Within Groups	14631,960	284	51,521			
	Total	15143,945	288				

Negativeness of Technology	Between Groups	399,272	4	99,818	4,030	,003*	Anatolian H.S.-Science H.S.-Vocational H.S.
	Within Groups	7034,638	284	24,770			
	Total	7433,910	288				
Importance of Technology	Between Groups	155,152	4	38,788	2,022	,091	-
	Within Groups	5446,745	284	19,179			
	Total	5601,896	288				
Technology for All	Between Groups	27,843	4	6,691	,820	,514	-
	Within Groups	2411,929	284	8,493			
	Total	2439,772	288				
Overall	Between Groups	2243,296	4	560,824	2,791	,027*	Anatolian H.S.-Science H.S.
	Within Groups	57070,130	284	200,951			
	Total	59313,426	288				

*p<0,05

In Table 6, significant difference exists between attitudes of students in overall scale (F(4, 284)=2, 791 and p=0,027); tendency to technology (F(4, 284)=2,484 and p=0,044) and negativeness of technology (F(4,284)=4,03 and p=0,003) depending on the type of high school they want to attend. To put it another way, students' overall attitudes regarding technology, tendency to technology and negativeness of technology differ significantly according to the type of high school they prefer. Also Scheffe test was applied in order to find what types of preferred high school cause significant difference between units. Scheffe test results show that in overall scale the students preparing for science high schools ($\overline{X}$ = 84,13, S=16,66) have a higher positive attitude towards technology than those preparing for Anatolian high schools ($\overline{X}$ =78,86, S=13,13). As for Tendency to Technology, significant difference was found between science high schools ($\overline{X}$ = 25,42, S= 7,80) and Anatolian high schools ($\overline{X}$ =22,88, S=6,67). Regarding Negativeness of Technology, those preparing for science high schools ($\overline{X}$ =26,67, S=5,55) were found to have a higher positive attitude towards technology than those preferring Anatolian high schools ($\overline{X}$ =24,69, S=4,60) and vocational high schools (X=23,03, S=4,81). Under sub-constructs of Importance of Technology (F= 2,022, p=0,091) and Technology for All (F= 0,820, p=0,514), the difference between type of preferred high schools was not found significant at "p<0,05".

3.4. Findings regarding sub-problem of "Does attitude of middle school students towards technology vary according to the technological devices owned (tablets, computer, mobile phone)?"

t-test results of students' attitudes towards technology by technological devices owned are given in Table 7.

Table 7. t-test results of students' attitudes towards technology by technological devices owned

	Technological devices	Owned	N	X	S	sd	t	p
Tendency to Technology	Computer	Yes	202	23,64	7,26	287	1,324	,186
		No	87	24,87	7,18			
	Tablet	Yes	145	24,20	7,68	287	,437	,662
		No	144	23,82	6,80			
	Mobile Phone	Yes	237	23,89	7,09	287	,575	,565
		No	52	24,53	7,98			
Negativeness of	Computer	Yes	202	24,95	4,88	287	1,206	,229
		No	87	25,73	5,48			
	Tablet	Yes	145	25,80	4,94	287	2,070	,039*

Technology		No	144	24,56	5,15			
	Mobile Phone	Yes	237	25,30	4,96	287	,835	,404
		No	52	24,65	5,60			
	Bilgisayar	Yes	202	22,37	4,24	287	1,358	,175
Importance of Technology		No	87	21,60	4,75			
	Tablet	Yes	145	22,57	4,11	287	1,684	,093
		No	144	21,70	4,66			
	Mobile Phone	Yes	237	22,29	4,22	287	1,201	,231
		No	52	21,48	5,18			
	Computer	Yes	202	9,43	2,82	287	,951	,342
		No	87	9,08	3,09			
Technology for All	Tablet	Yes	145	9,48	2,83	287	,943	,346
		No	144	9,16	2,98			
	Mobile Phone	Yes	237	9,44	2,77	287	1,428	,154
		No	52	8,80	3,45			
	Computer	Yes	202	80,40	14,62	287	,485	,628
		No	87	81,29	13,76			
Overall	Tablet	Yes	145	82,66	14,67	287	1,662	,098
		No	144	79,27	13,93			
	Mobile Phone	Yes	237	80,93	14,11	287	,662	,509
		No	52	79,48	15,46			

*p<0,05

t-test was applied in order to find out the effect of technological devices owned by students on their attitude towards technology, and results of the test are given in Table 7. It is understood that there is a significant difference between attitudes of students having tablets and those not having tablets (t=2,070 and p=0,039) only under "Negativeness of Technology". There was found no significant difference between students depending on their technological devices in overall scale or other sub-constructrs at significance level of "p<0,05".

3.5. Findings regarding sub-problem of "What are the attitudes of middle school students towards technology like?"

Table 8. Descriptive Statistics for Middle School Students' Attitude towards Technology

	N	$\overline{X}$	ss	V%
Tendency to Technology	289	24,014	7,251	30,197
Negativeness of Technology	289	25,187	5,081	20,172
Importance of Technology	289	22,150	4,410	19,915
Technology for All	289	9,329	2,911	31,200
Total	289	80,675	14,351	17,789

Table 8 displays descriptive statistical data regarding attitudes of 289 students of eighth grade towards technology. For tendency to technology, the mean/average was calculated as ($\overline{X}$) "24,014", standard deviation (ss) 7,251 and dependent variance coefficient???/bağıl değişim katsayısı was found to be (V%) "30,197. Considering the lower (8) and upper limits (40) for this dimension, it seems that students have a tendency to technology at medium level. Dependent variance coefficient above "25 %" indicates the lack of consensus on this aspect of attitude towards technology. In other words, it could be suggested that students' views on this aspect are different from the average obtained. In relation to negativeness of technology, average was found as "25,187", standard deviation as "5,081" and dependent variance coefficient was found as "20,172". As lower and upper limits in this sub-scale are (7) and (35), respectively, the students' negative attitude towards technology was found slightly higher than medium level in this study. Also since dependent variance coefficient was below "25%", it seems that there is consensus among students on this aspect. Regarding importance of technology, the average was calculated as "22,150", standard deviation "4,410" and dependent variance coefficient as "19,915". In the range of minimum ("6") and maximum ("30") scores on this sub-scale, the students could be said to have a positive attitude towards importance of technology. It seems from dependent variance coefficient that there is agreement among students on this issue. As

for the sub-construct of Technology for All, average was found as "9,329", standard deviation "14,351" and dependent variance coefficient as "31,200". Thinking the lowest and highest scores on this dimension as "3" and "15", respectively, it could be suggested that the students' attitude is at medium level. Due to the dependent variance coefficient above 25 %, the students are not compliant with the average/öğrencilerin ortalamadan dağılım gösterdikleri görülmektedir. To put another way, the students seem to be lacking consensus about the issue. As for the overall score obtained from the scale, average was "80,675", standard deviation was "14,352" and dependent variance coefficient was "17,789". Minimum score on overall scale is 24 and maximum is "120"; thus, it could be said that students have a positive attitude towards technology. Also it was understood from dependent variance coefficient that the students do not vary from the average much.

4. Conclusions and discussion

Following conclusions were drawn from present study:

- No significant difference was observed between middle school students' attitudes towards technology depending of preferred high school. However, those attending private school obtained higher scores from both sub-constructs and overall scale, which could be said to be significant.
- Middle school students' attitude towards technology differs significantly by gender in overall scale as well as sub-constructs such as Tendency to Technology, Negativeness of Technology and Technology for All. In general, males obtained higher average scores than females in the study. This result is similar to Altun and others (2007)" and Altun (2011). Besides, in their study on second grade students Şererfhanoğlu and others (2008) found no significant difference between students' attitude towards technology by gender. Also Oktay and Çakır (2012) found higher averages for females than males in their study about elementary teachers' attitude towards technology.
- In the study, students' scores regarding attitude towards technology showed significant difference by type of preferred high school in overall scale besides sub-constructs one and two. In other words, students' overall attitude towards technology, their tendency to technology and negativeness of technology are found to be significantly related with type of preferred high school. In overall scale and first and second sub-construct, those preparing for science high schools obtained higher attitude scores than those preparing for Anatolian high schools. Likewise, in sub-construct two, the students studying for science high schools were found to have a more positive attitude towards technology than those preparing for Anatolian high schools and vocational high schools.
- It was found out that ownership of technological devices resulted in higher scores in both overall scale and sub-constructs; however, significant difference was identified between those having and not having a table under "Negativeness of Technology" only. The students who own tablets have a more negative attitude than those not having tablets. On the other hand, there was found no significant difference between students depending on their ownership of computer or mobile phone.
- Generally speaking, it can be said students' attitude towards use of technology is high in this study. This result is supportive of Aydoğan's (2013) findings. Specifically in sub-constructs, students' attitude was found at medium level regarding tendency to technology and technology for all, while it could be regarded high for negativeness of technology and importance of technology.

5. Recommendations

In today's information and technology age, it is necessary to improve attitudes towards technology of young people who are going to shape our future. In this context, following recommendations can be made in the light of our findings:

- Considering the fact that there is difference, small albeit, between students at private and state schools, computer and internet facilities should be made more available at state schools, and educational investments should be increased so that technological deficiency should be made up at such schools. In this way, the gap between two types of schools can be narrowed. As discussed by Çelik and Kahyaoğlu (2003), potential learning environments employing computers should be introduced, and students should be encouraged to use them for both in-class and out-of-class learning activities.

- Attitude of females towards use of technology was found lower than males in both overall scale and sub-constructs. Specific studies can be carried out with girls to decrease the difference.
- Owing to the fact that the students preparing for Anatolian and vocational high schools have a lower attitude towards technology than those preparing for science high schools, both teachers and administrators in such schools can implement certain programs to improve their attitude.
- There should be more studies available for integrating instruction programs with computer, and such materials should be provided for teachers' use.
- Departing from the fact that students cannot develop a positive attitude towards using technology in a classroom environment where teachers do not use it, teachers should be supported with training, seminars and courses so that they can use technology more efficiently.
- This study was implemented with eighth grade students in middle schools only in one district. It can be duplicated in other districts for different grade levels to identify students' attitude towards technology. In addition, other studies can be carried out in a way to also involve parents as one of the most important stakeholders of education and instruction process. As an example, studies can be carried out for identifying parents' attitude and measures to be taken for increasing the use of technology.

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